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TABLES 4, 5 & 6 - LEACHATE DISPOSAL

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SUPERFUND DIVISION
REMEDIAL ENFORCEMENT RESPONSE BRANCH

FIVE-YEAR REVIEW REPORT

SITE NAME: ADAMS County LANDFILL / Quincy LANDFILL

INITIAL & DATE

RPM: JK 3/28/03

FIVE-YEAR REVIEW
COORDINATOR
(Rosita Clarke):

RCM 3/27/03 w/1 comment

SECTION CHIEF:

JR for JPM 3/28/03

JAMES N. MAYKA:

JPM for JM 3/28/03

WILLIAM E. MUNO:

WEM for JPM 3/28/03

RETURN TO: TERRY ROUNDTREE

PHONE# 3-3236

COMMENTS: _____

Five-Year Review Report

**Five-Year Review Report
for
Adams County Landfill/Quincy Landfill Superfund Site
Town of Quincy
Quincy, Illinois**


March 2003

PREPARED BY:

**United States Environmental Protection Agency
Region 5
Chicago, Illinois**

Approved by:

Date:

for 

William E. Muno, Director
Superfund Division

3/28/03

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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	United States Environmental Protection Agency
CFR	Code of Federal Regulations
ESD	Explanation of Significant Difference
MCL	Maximum Contaminant Level
MCEG	Maximum Contaminant Level Goal
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PAH	Polyaromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PPB	Parts per Billion
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
VOC	Volatile Organic Compound
Illinois EPA	Illinois Environmental Protection Agency

Executive Summary

The five-year review of the Adams County Landfill/Quincy Landfill site in Quincy, Illinois was completed in March 2003. The remedy is protective of human health and the environment in the short term. There are no current exposure pathways and the remedy appears to be functioning as designed. The cover and putting citizens on public water supply eliminates the source of contamination and have achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contaminants in soils and sediments. A few deficiencies that do not immediately impact the protectiveness of the remedy were noted.

Both the Health and Safety Plan and the Contingency Plans are in place, sufficient to control risks, and properly implemented. The remedy for the Adams/Quincy County Landfill (Adams County Landfill) Superfund Site (the site) include landfill cover/containment, access controls, institutional controls and leachate collection system.

The Illinois Environmental Protection Agency (Illinois EPA) in cooperation with the United States Environmental Protection Agency (U.S. EPA) completed oversight of all major construction activities for the Adams County Quincy Landfills 2 & 3 Superfund Site (site).

The site is located along Old Broadway Road south of Illinois Route 104 approximately five miles east of the City of Quincy within the eastern $1/2$ of Section 1, Township 2 South, Range 8 West of the Third Principal Meridian in Melrose Township, Adams County, Illinois. The total size of the site is fifty-six acres with the landfill disposal activities occurring in an area of about 33 acres north of the intermittent stream which approximately bisects the site in an east to west fashion. The northern limit of the facility is Old Broadway Road, the western boundary is a private gravel road, the southern boundary is a wooded tract, the eastern side of the Site is bounded by pasture land and a home site.

The site achieved construction completion in March 1999. The assessment of this five-year review found that the remedy was constructed in accordance with the requirements of the September 30, 1993, Record of Decision (ROD). The remedy is protective of human health and the environment in the short term and there are no current exposure pathways and the remedy appears to be functioning as designed. The landfill cap has been constructed over all the wastes, a leachate collection system is operating, and a public water supply was provided to the residents.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): AdamsCounty Landfill/Quincy Landfill		
EPA ID (from WasteLAN): ILD980607055		
Region: V	State: IL	City/County: Quincy/Adams
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final Deleted <input type="checkbox"/> other (specify) _____		
Remediation status (choose all that apply): Under Construction <input checked="" type="checkbox"/> Operating Complete		
Multiple OUs? Yes <input checked="" type="checkbox"/> No	Construction completion date: 3-31-1999	
Has site been put into reuse? YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
Reviewing agency: <input checked="" type="checkbox"/> EPA <input checked="" type="checkbox"/> State Tribe Other <u>Federal Agency</u> _____		
Author name: Terry Roundtree		
Author title: Remedial Project Manager	Author affiliation: EPA Region V	
Review period: 10/1/2002 to 3/30/2003		
Date(s) of site inspection: 12/15/2002		
Type of review: <input checked="" type="checkbox"/> Statutory <div style="display: flex; justify-content: space-around; font-size: small;"> Policy Post-SARA Pre-Sara NPL-Removal only </div> <div style="display: flex; justify-content: space-around; font-size: small;"> Non-NPL Remedial Action Site NPL State/Tribe-lead </div> <div style="text-align: center; font-size: x-small;">(Regional Discretion)</div>		
Review number: <input checked="" type="checkbox"/> 1(first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <u>Other (specify) _____</u>		
Triggering action <input checked="" type="checkbox"/> Actual RA Onsite Construction at OU #____ Actual RA Start at OU#____ <div style="display: flex; justify-content: space-between; font-size: small;"> Construction Completion Previous Five-Year Review Report </div> <u>Other (specify) _____</u>		
Triggering action date (from WasteLAN): 3/10/1998		
Due date (five years after triggering action date): 3/30/2003		

Five-Year Review Summary Form, cont'd.

Issue:

- 1) Damage to Landfill cover has occurred in the past due to heavy equipment and animals.
- 2) Leachate spills have occurred in the past.

Recommendations and Follow-up Actions:

- 1) Continue monitoring landfill cover and make repairs to the cover as needed.
- 2) Need for continual O&M leachate system

Protectiveness Statement(s):

The remedy is protective of human health and the environment in the short term. There are no current exposure pathways and the remedy appears to be functioning as designed. The cover and putting citizens on public water supply eliminates the source of contamination and have achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contaminants in soils and sediments.

Long-term protectiveness of the of the remedial action will be achieved when cleanup goals are met.

Other Comments:

There have been two repairs on the cap since the construction of the remedial action. The tears in the cap were due to heavy equipment coming in contact with the cap. The cap has been repaired and will be evaluated further in the summer of 2003 for further damage. There are some concerns with the leachate run off at the site probably due to the tear in the cap. A full system evaluation is scheduled in the summer of 2003.

**ADAMS COUNTY LANDFILL/QUINCY LANDFILL SITE
QUINCY, ILLINOIS
FIVE YEAR REVIEW REPORT**

I. INTRODUCTION

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

EPA is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

EPA, Region 5, is conducting this first five-year review of the remedy implemented at the Adams County Landfill Superfund Site in Quincy, Illinois. This review was conducted by the Remedial Project Manager (RPM) for the entire site from May through December 2002. This report documents the results of the review.

The triggering action for this statutory review is the initiation of construction activities for the remedial action on March 10, 1998. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site that allow for unlimited use and unrestricted exposure.

II. SITE CHRONOLOGY

Table 1 - Chronology of Site Events

<i>EVENT</i>	<i>DATE</i>
Initial Discovery of Problem	May 1, 1981
Proposed on NPL	June 24, 1988
Listed on NPL	August 30, 1990
RI/FS (entire site)	September 12, 1990 -September 30, 1993
ROD (entire site)	September 30, 1993
RD	March 31, 1996 – December 18, 1997
ESD	December 1997
RA Start	December 18, 1997
RA Construction Start	March 10, 1998
RA Completed	March 31, 1999
Final Inspection of Entire Site	March 24 1999
PCOR	March 31, 1999,
O&M Activities Began	August 1, 1999
First Five -Year Review	March 2003
Next Five -Year Review	March 2008

III. BACKGROUND

Physical Characteristics

The Adams County Quincy Landfills 2 & 3 site is located in a rural area on Old Broadway Road south of Illinois Route 104 approximately 5 miles east of the City of Quincy within the eastern 1/2 of Section 1, Township 2 South, Range 8 West in Melrose Township, Adams County in west-central Illinois. The site's northern limits are bounded by Old Broadway Road, the eastern boundary is adjacent to pastureland, the southern limit is bounded by a wooded tract, and the western boundary is bordered by a private lane.

The fifty-six-acre site is wire fenced on all sides with a locked access gate on the northern boundary. The only structure on site is a metal storage building located near the north entrance gate. The remnants of an un-maintained gravel roadway cross the middle of the site from the entrance gate on the north to the southwestern side of the site.

The landfill is located on an upland of the Mississippi River and the topography of the area is generally hilly, sloping from the north to the south and southwest. Surface drainage on the site flows to the south and southwest to an unnamed stream tributary to Mill Creek. A drainage ditch on the western boundary of the site collects surface runoff and discharges to the stream. A map of the site is provided in attachment 1.

Land and Resource Use

Prior to Initiation of landfill operations in 1967, the Site was used for the pasturage of livestock. In January 1967 the Adams County Health Department approved a landfill development permit requested by Ronald Thomas. In March 1971, the Illinois EPA issued Ronald Thomas and Marion Neill a permit to operate a landfill at the Site. Marion Neill's association with the landfill ceased in October 1971. The Illinois EPA issued Ronald and Sarah Thomas a permit to operate the landfill in February 1972. The City of Quincy leased the landfill from Ronald Thomas in September 1972, and in January 1973 the Illinois EPA issued a permit to the City of Quincy to operate the landfill. Permits to expand the size of the landfill were issued to the City of Quincy by the Illinois EPA in 1974 and in 1975. The City operated the Site until August 1978 and purchased the Site from Ronald and Sarah Thomas in April 1982.

History of Contamination

Under operation by the City of Quincy, the landfill was alleged to have received liquid wastes which were reportedly retained in holding pits located on the north and west portions of the Site near completed landfill trenches. Liquid wastes were reportedly pumped into the completed trenches by well point injectors and covered with fill. After the closure of Quincy Municipal Landfill #1 in September 1972 the Site became the only operating landfill in Adams County until August of 1975. During its operational history the Site received the majority of the solid waste generated in the county, as well as industrial waste from the City of Quincy's manufacturing

sector. Liquid industrial wastes including solvents, acids, sludges, spent non-halogenated solvents, spent halogenated solvents used in degreasing, wastewater treatment sludges from electroplating operations, hydraulic oil, machine coolants, thinners, paint solvents, methylchloroethene, selenium, toluene, methylene chloride, acetone, and chloroethene were allegedly landfilled at the Site. No leachate collection or containment system was ever installed on the Site. Numerous leachate seeps occur throughout the landfill. Most seeps are located on the southwestern side of the Site, although several have been seen in the old roadway and a large seepage area occurs in a low-lying area in the middle of the Site. Leachate collects in low areas and is potential for off-site surface migration, primarily in two locations-along the western boundary fence and on the southwest to the nearby stream.

Initial Response

A preliminary assessment was completed in July 1983 by the EPA Field Investigation Team (FIT). The site received a Hazard Ranking Score (HRS) score above 28.5 and was placed on the National Priorities List (NPL) on August 30, 1990.

On May 19, 1981 the City of Quincy completed a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Notification of Hazardous Waste Site form for the Adams County Quincy Landfills 2 & 3 site. The notification acknowledged the landfill disposal of unknown quantities of inorganics, solvents, heavy metals, mixed municipal wastes, and unknown wastes. Additional notices were received from generators of wastes disposed at the site.

On July 1, 1983, a preliminary assessment of the site was completed by Ecology and Environment, Inc., a field investigative team contractor for the United States Environmental Protection Agency (U.S. EPA). The preliminary assessment estimated that approximately 3000 people were potentially affected by groundwater contamination from spent halogenated solvents used in degreasing, wastewater treatment sludge from electroplating operations, and 1,1,1-trichloroethane accepted at the site.

On March 7, 1984, the same U.S. EPA contractor completed a site inspection. It was estimated that the site had received 343,000 gallons of sludge containing paint and toluene; 2,800,000 gallons of oily waste; 312,000 gallons of solvents; 343,200 gallons of other organic chemicals; 180,000 gallons of inorganic chemicals; 180,000 gallons of bases. Estimates were based on Illinois EPA supplemental permits for disposal at the site.

Basis for Taking Action

Contaminants

Hazardous substances that have been released at the site in each media include:

Soil

Benzene
Ethylbenzene
Total Xylenes
Bis (2 -ethylhexyl phthalate)
Chloroethane
Lead
Mercury
Arsenic
Selenium
1,1-Dichloroethane
Trans-1,2-dichloroethene
Tetrachloroethene
1,1,1-Trichloroethane
Vinyl Chloride
1,1-dichloroethene
Arochlor-1254 (PCB)
Di-nButylphthalate

Leachate

Benzene
Ethylbenzene
Total Xylenes
Bis (2 -ethylhexyl phthalate)
Chloroethane
Lead
Mercury
Arsenic
Selenium
1,1-Dichloroethane
Trans-1,2-dichloroethene
Tetrachloroethene
1,1,1-Trichloroethane
Vinyl Chloride
1,1-dichloroethene
Arochlor-1254 (PCB)
Arochlor-1242 (PCB)
Chlorobenzene

Groundwater

Benzene
Ethylbenzene
Total Xylenes
Bis (2 -ethylhexyl phthalate)
Chloroethane
Lead
Mercury
Arsenic
Selenium
1,1-Dichloroethane
Trichloroethene
Trans- 1,2-dichloroethene
Tetrachloroethene
1,1,1 -Trichloroethane
Vinyl Chloride
1,1-dichloroethene

Exposure to soil and groundwater is associated with significant human health risks due to exceedances of EPA's risk management criteria for the reasonable maximum exposure scenarios. The carcinogenic risks were highest for exposure to contaminated groundwater from a possible future ingestion pathway. Soil contaminants posed the greatest non-carcinogenic risk to human health through dermal contact and ingestion by children and future workers, primarily from lead and arsenic.

IV. REMEDIAL ACTIONS

Remedy Selection

The record of decision (ROD) for the Adams/Quincy County Landfill site was signed on September 29, 1993. The remedial action objective addresses two areas of concern, leachate and groundwater. The leachate remedial action addresses the source of the contamination by collecting and treating on-site waste. The function of this action is to control the landfill site as a source of groundwater contamination, to reduce the risks associated with the site and reduce exposure to contaminated materials, and to prevent untreated leachate from running off site. The groundwater response action involves long-term monitoring with cleanup levels. Failure to meet those cleanup levels will trigger further remedial action.

The major components of the selected remedy include:

- Installation of a security fence around the landfill site;
- Deed restrictions to prohibit groundwater use and building construction on the site;
- Leachate collection, treatment, and monitoring;
- Installation of surface controls to reduce erosion;
- Landfill cap improvements to provide a minimum three feet of cover on the landfill;
- Provision of a public water supply to nearby residents;
- Groundwater monitoring;
- Groundwater containment and treatment if groundwater cleanup levels are not met and maintained.

Explanation of Significant Differences

In December 1997, the Illinois EPA issued an explanation of significant differences (ESD) which modified the remedy selected in the ROD. The ESD modified two parts of the selected remedy; warning sign language and leachate discharge to the Publicly Owned Treatment Works (POTW) rather than to surface waters by way of a NPDES permit. Both modifications to the remedy were considered minor and the leachate discharge to a POTW was originally evaluated in the Focused Feasibility Study and the ROD and were available to the public for comment, consequently this change did not necessitate public involvement and an ESD was signed by the Illinois EPA with concurrence from the U.S. EPA.

Remedy Implementation

The remedy includes physical access restriction with a six-foot high cyclone fence with barbed wire at the top, around the entire site sufficient to prevent the public from easily entering the site. The fence is posted with numerous visible warning signs to inform the public of potential site hazards.

The site's real estate deed include prohibition of on-site groundwater use; on-site building construction; and on-site drilling except for the purposes of remedial design, sampling, monitoring, and remedial action.

A public water supply was supplied to six nearby residences located northwest of the site in order to eliminate the groundwater exposure pathway to those persons consuming groundwater.

The remedy includes a groundwater monitoring program to track the changes in impact of site constituents on groundwater, which would then be used to determine if additional actions are triggered by concentrations exceeding levels pursuant to the Illinois Groundwater Quality Standards at 35 Illinois Administrative Code 620. It should be noted that a contaminated groundwater plume migrating off site has not been scientifically identified and located. However, no other source of off-site groundwater contamination has been identified.

This Record of Decision did not require the immediate implementation of an active groundwater remedy because existing data indicate that relatively few sampling results showed groundwater contamination at levels of concern. The leachate source control remedy has a positive impact on groundwater quality, and effective source control combined with natural attenuation which adequately address low-level groundwater contamination. Groundwater monitoring indicates that contamination has not exceeded compliance levels, a groundwater pump and treat system will be installed to minimize contaminant migration if levels are exceeded.

The monitoring program is consistent with 35 Illinois Administrative Code 620.505 and 620.510. A groundwater management zone as described at 35 Illinois Administrative Code 620 must be established for areas undergoing effective corrective action.

Monitoring would continue for a minimum of five years with duration of monitoring dependent on results of the statistical evaluation of groundwater data. Monitoring may cease after standards at 35 Illinois Administrative Code 620.410 have been complied with for a minimum of one year.

Pursuant to the requirements of 35 Illinois Administrative Code 724.195 a groundwater point of compliance must be established at the site boundary, which is also the source boundary. Compliance shall be determined by analysis for the parameters in Appendix I at 35 Illinois Administrative Code 724.

The leachate monitoring program tests leachate for five-day biochemical oxygen demand, chemical oxygen demand, total suspended solids, dissolved iron, pH, and any other parameters known present based on analytical data or believed present at the point of leachate discharge into

surface waters. Any discharge to surface waters of the State is subject to the NPDES program at 40 CFR 122, which is implemented in Illinois pursuant to 35 Illinois Administrative Code 309.

Surface controls including berms, lined ditches, and catch basins manage surface water infiltration into the landfill and to minimize landfill surface erosion. The purpose of the controls is to direct infiltration away from known disposal areas.

Components of the remedy were constructed and maintained pursuant to the requirements of 35 Illinois Administrative Code 807 and 811, Solid and Special Waste Management Regulations, specifically regarding final cover and closure requirements. This includes a minimum of three feet of clay cover over the landfill surface, particularly in areas of cap erosion and leachate management. Site leachate is collected through a network of subsurface drains and is discharged to the City of Quincy Wastewater Treatment Plant for treatment.

The site achieved construction completion in March 1999. A Preliminary Close Out Report (PCOR) was completed on March 31, 1999.

System Operations/Operation and Maintenance (O&M)

Leachate treatment is provided by the City of Quincy Wastewater Treatment Plant. In June of 1998, over two thousand feet of leachate collection lines were installed in a trench/french drain type manner at depths ranging from three to ten feet along the shallow down gradient (south and west) sides of the site. A collection tank was installed to store the collected leachate. In the fall of 1998, the construction of the solid waste cap was completed over the thirty acres of landfill. The cap consists of a geo-synthetic clay liner, a gravel drainage layer, and a protective/vegetative layer. Landfill gas is released via a network of passive vents installed through the cap in late 1998.

The implementation of the remedial action commenced on March 10, 1998, the main components of the selected remedy include: Installation of a security fence around the landfill site; deed restrictions to prohibit groundwater use and building construction on the site; leachate collection, treatment, and monitoring; installation of surface controls to reduce erosion; landfill cap and provision of a public water supply to nearby residents; final site grading, fence repairs, erosion controls, well repairs, final seeding, and minor access road repair work and construction were completed in September 1999.

Operation, maintenance, and monitoring activities are performed by Conestoga-Rovers & Associates (CRA) a contractor for the PRP Group. In addition, the City of Quincy has on site personnel performing activities associated with operation and maintenance.

Maintenance activities for the final cover include mowing, earthwork activities to correct erosion and sedimentation problems, re-vegetation of disturbed or distressed areas in accordance with RD specifications, regrading in settlement areas as determined necessary, and localized repairs due to intrusion, vandalism, etc. The final cover is inspected quarterly for signs of damage. In

any event, inspections are projected to continue for a minimum period of 30 years (see Tables 2-6 for O&M costs and leachate disposal volumes).

Storm water management system maintenance involves activities to maintain the flow of storm water through the channels, drop basins, discharge structures, etc. which comprise the system. O&M activities require that the integrity of the stream bank is stabilized. These activities include: the clearing of debris to allow for water flow, the re-vegetation of vegetated channels and berms where necessary, earthwork necessary to maintain channel slopes and channel berms.

Operation of the leachate management system involves the periodic removal of collected leachate from the storage tank with subsequent transportation to and disposal at an offsite treatment facility, currently the City of Quincy Publicly Owned Treatment Works. The leachate storage tank has a capacity of 10,000 gallons which is approximately 3 times the maximum anticipated a 5-day leachate generation rate for the facility. The frequency of leachate removal, transport, and disposal activities is dependent on the results of ongoing monitoring activities performed to gauge leachate generation and collection quantities. Leachate is removed from the leachate storage tank via a vacuum truck or portable pump to a tanker truck. The leachate is then transported to the City of Quincy POTW for disposal.

Maintenance of the leachate management system requires activities necessary to ensure the system performs as designed. The system has been designed to collect leachate from known leachate seep locations and direct the leachate through the collection and conveyance piping, via gravity flow, to the leachate storage tank for eventual removal, treatment, transport, and disposal. Maintenance activities include the cleaning of piping runs to remove blockages and solids buildup and the repair/replacement of system appurtenances (manhole covers, tank vents, access covers, valves, clean out ports, etc.) as required.

Inspection of monitoring wells is performed to evaluate well conditions, whenever a sampling round is undertaken. The inspection involves looking at general well conditions including the condition of the lock, cap, protective casing, pad (if present), well casing, etc.

Table 2 : Budget Summary

CY 2002				
BUDGET SUMMARY				
POST-CLOSURE ACTIVITIES				
ADAMS COUNTY QUINCY LANDFILLS NO.2 & 3				
QUINCY, ILLINOIS				
<i>Task</i>	<i>Current CRA Subcodes</i>	<i>Budget Estimate</i>	<i>Total Cost To Date⁴</i>	<i>Budget Remaining</i>
Project Management	11	\$ 15,000.00	\$ 3,732.40	11,267.60
Support to City of Quincy for Miscellaneous Issues	12	\$ 7,000.00	\$ 1,744.73	TBD
Operation and Maintenance Plan ¹	13	\$ 3,500.00	\$ 0.00	\$ 3,500.00
Meetings with Group and IEPA	15	\$ 7,000.00	\$ 0.00	TBD
Post Closure Groundwater Monitoring, Off-site Gas Migration Investigation, Downgradient Groundwater Investigation	17	\$144,700.00	\$ 0.00	\$ 144,700.00
Additional Illinois EPA Issues Related to Post Closure and Future Operation and Maintenance	18	TBD	\$ 0.00	TBD
TOTAL - BUDGETED TASKS:		\$ 177,200.00	\$ 5,477.13	TBD

Table 3- Annual System Operations/O&M Costs

Dates		Total O&M Costs
From	To	
August 1999	August 2000	\$154,194
August 2000	August 2001	\$201,153
August 2001	August 2002	\$123,923
August 2002	August 2003	\$33,424

Table 4: Leachate Disposal

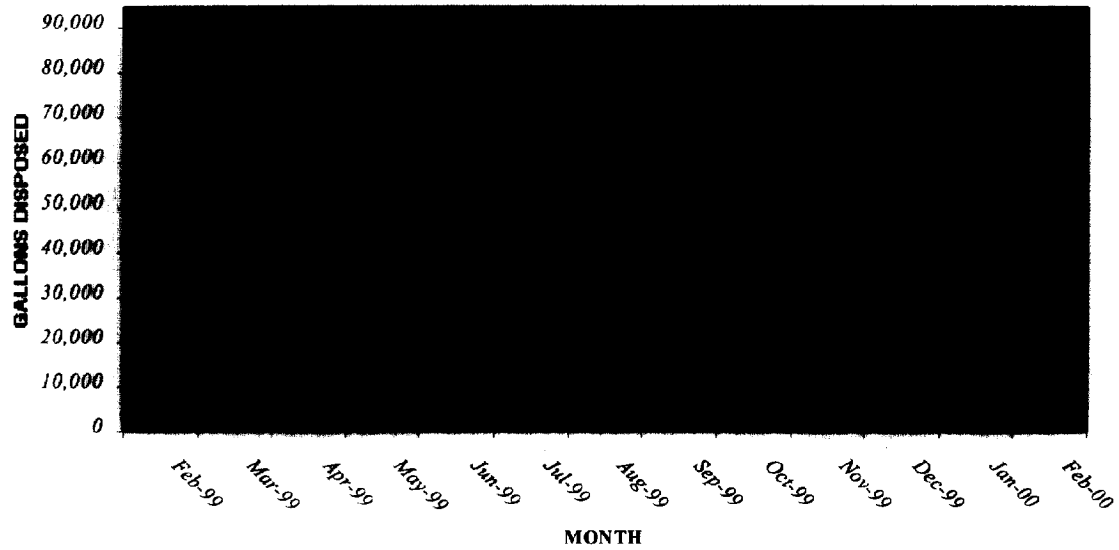


Table 5: Leachate Disposal

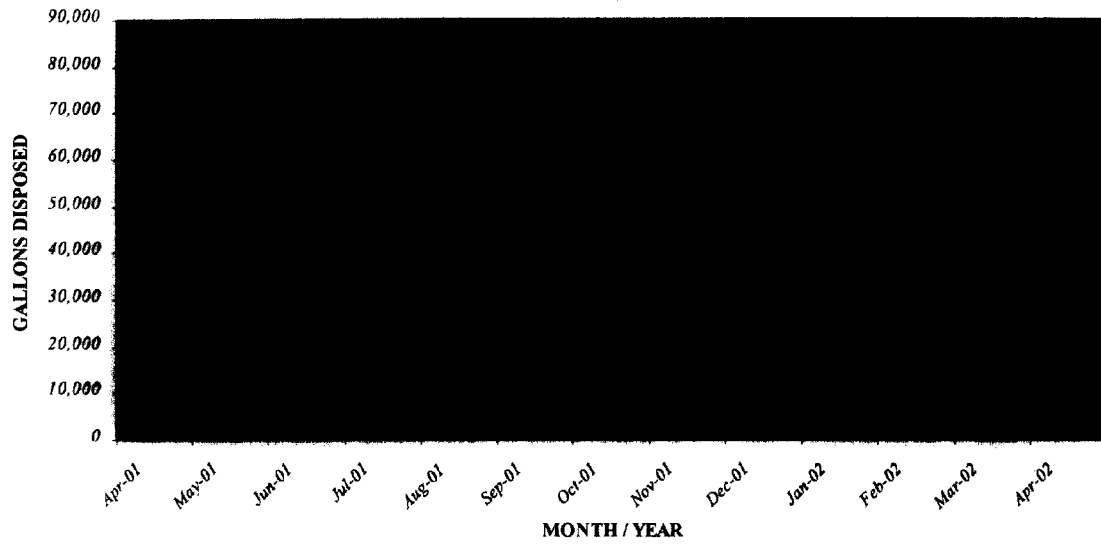
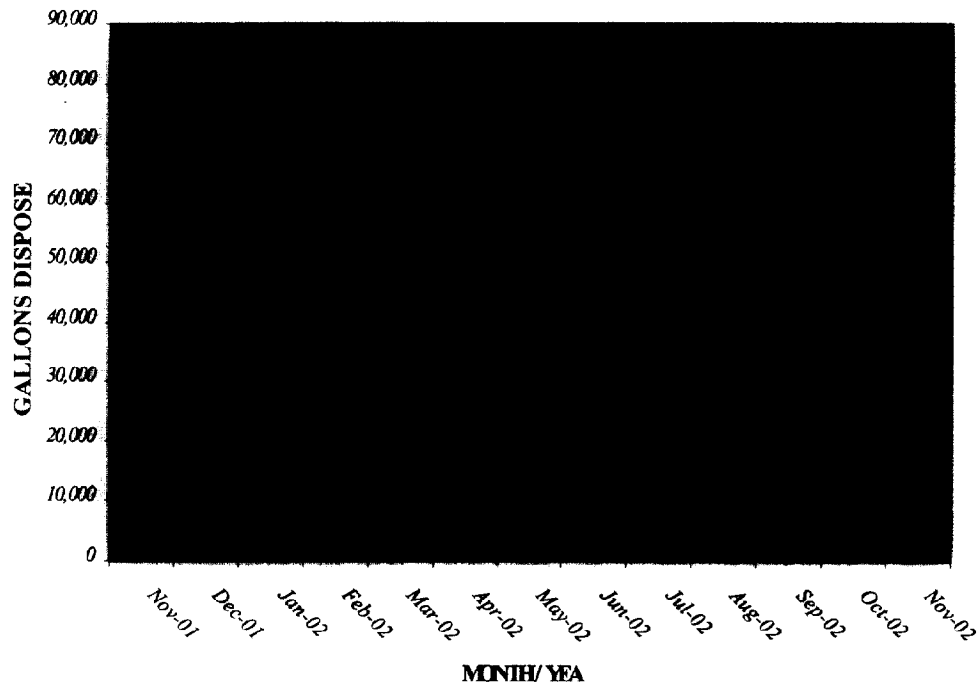


Table 6: Leachate Disposal



V. PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

This is the first five-year review for the Adams/Quincy Landfill Site.

VI. FIVE-YEAR REVIEW PROCESS

Administrative Components

Members of the Illinois EPA and the City of Quincy were notified of the initiation of the five-year review in August 2002. The Adams/Quincy Landfill Five-Year Review team was led by Terry Roundtree of EPA, RPM for the site, and included the Illinois EPA (Rick Lanham, Project Manager), Phil Harvey of Conestoga-Rovers & Associates (CRA) contractor for the City of Quincy, Donald Kulek and Charles Jones representatives of the City of Quincy.

This five-year review consisted of the following activities: a review of relevant documents (see Attachment 2); interviews with local government officials and representatives of the construction and the operations contractors; and a site inspection. In addition, a notice regarding the forthcoming review was placed in the local newspaper. The completed report will be placed in the information repository . Notice of its completion will be placed in the local newspaper.

Community Involvement

Activities to involve the community in the five-year review process were initiated in November 13, 2002, with a notification to the local newspaper for the Adams County/Quincy Landfill Superfund site stating that a five-year review is being conducted at the site. The add announced the start of the five-year review and invited citizens to get involved in the process.

Since the November 13, 2002, notice, there has been no member of the community that has voiced any interest or opinion concerning the five-year review process.

Document Review

This five-year review consisted of a review of relevant documents including O&M records, evaluation reports, monitoring data and Interview Report (See Attachment 3). Applicable groundwater cleanup standards, as listed in the 1993 ROD, were reviewed.

Data Review

The Post-Closure Groundwater Sampling Plan was submitted by the PRPs in late April 2001. Also, a Field Sampling and Analysis Plan for off-site Groundwater sampling was submitted at that time. After considerable review and discussions with the PRPs, the Illinois EPA accepted the plans in early April 2002. However, the Illinois EPA's requirement for additional off-site groundwater investigation and monitoring well installation/sampling did not start until early March 2003 due to the PRPs difficulties in negotiating access agreements. The additional investigation and groundwater monitoring/sampling will follow the April 2001 protocol.

Prior to the start of the remedial action, nineteen Site groundwater monitoring wells were sampled in the early June (spring) and late September (fall) of 1997, and again in the January (winter) of 1998. These wells were sampled for metals, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs). Four of the nineteen wells around the perimeter of the site were also sampled for herbicides, pesticides, and polychlorinated biphenyls (PCBs).

The Illinois Department of Public Health (IDPH) evaluated the results of the 1990 groundwater summary data and the 1997 on-site groundwater samples provided by the Illinois EPA. Certain groundwater samples exceeded the comparison values for arsenic (Table 7). Again, wells with the highest levels of arsenic were in the areas of leachate seeps or surface runoff on the site.

The levels of two VOCs, methacrylonitrile and vinyl chloride, exceeded comparison values or MCLs in on-site groundwater samples (Tables 8 and 9). IDPH also reviewed on-site groundwater monitoring and residential well summary statistics provided by the Illinois EPA. The frequency of detection for vinyl chloride was 4 in 60. Two of these detections were from one monitoring well, and two were from residential wells. The homes using these wells were connected to public water in 1986, but Illinois EPA kept the wells open for further sampling. These private wells were sealed in 1998. With the provision for municipal water, there are no known groundwater receptors adjacent to, or down gradient from, the landfill. All adjacent residents are on municipal water.

The most recent sampling of Site groundwater occurred in November 2000 (Attachment 4), additional sampling was postponed due to disagreement with the PRPs over the requirements of the Remedial Design/Remedial Action (RD/RA) Consent Decree and Statement of Work. Those issues were resolved in April 2002 with the requirement that further off-site monitoring and sampling was necessary and that access agreements were required for this and a related landfill gas investigation. The November 2000 sampling event report was submitted by the PRPs

consultant to the Illinois EPA in February 2001. The first post-closure sampling event was intended to confirm the previous data (Tables 7-9), or determine if changes in the distribution of landfill constituents/contaminants have occurred since the completion of the landfill cap and leachate collection system. The first post-closure monitoring event was performed using the same procedures, sample locations, and analytical parameters as the previous 1997-98 sampling rounds.

The concentrations of the detected chemicals in the November 2000 sampling event (Attachment 4) are, in general, similar to previous sampling events in Tables 7-9. Important exceptions are that neither arsenic nor lead were detected in any wells in the November samples. Both arsenic and lead had been detected in samples from several monitoring wells in previous events (1997-1998).

Exceedences occurred only in shallow monitoring wells. The shallow wells are completed for the most part in glacial till underlying and adjacent to the waste. Most metal exceedences of the standards are for iron and manganese concentrations. It is possible that this maybe naturally occurring, as the distribution of iron and manganese detections is uniform throughout the Site, and because both metals are common constituents within the dolomite source rock. The only other metal exceedences are barium and nickel which occurred in one sample from monitoring well 2D. None of the metals results for the deep wells exceeded the standards.

VOCs that exceeded the standards are benzene and well 2D and vinyl chloride at 4D and Q3D. Other organic compounds that were commonly detected in samples from shallow wells include 1,1 -dichloroethane, chloroethane, cis -1,2-dichloroethene, trichloroethene, and toluene. These COCs were all detected at concentrations below the standards.

Conclusion

The data collected from the November 2000 sampling event is consistent with the data from the previous four events, or those prior to cap and leachate collection completion. The groundwater data indicate that the shallow till, and more importantly, the bedrock groundwater beneath the site, is not significantly affected by landfill contaminants VOCs concentrations are low and the two compounds that exceed the standards, benzene and vinyl chloride, typically degrade readily. Additionally, these were only detected in shallow wells adjacent to waste limits. The detected compounds are typical of older municipal landfills, since these types of waste are known to contain hazardous substances that can leach to groundwater.

The frequency of metal detections is low, as are the exceedences of the standards. Where exceedences occur, the concentrations are generally just above the standard. Most of the metal exceedences are for iron and manganese which may be naturally occurring. There is no health based federal MCL for iron or manganese in drinking water. The few exceedences were found to occur in samples collected from shallow wells directly adjacent to the waste. Drinking wells within the Quincy's area utilize the deeper bedrock aquifers, therefore, groundwater within the bedrock/channel sand aquifer is the primary concern in regard to off-site migration. However, it should be noted that there are no private, or public, water wells currently in use within a radius of 0.75 miles from the landfill. As such, the November 2000 sampling event demonstrated that no exceedences occur in the bedrock/channel sand groundwater migrating off Site to the west and northwest of the site.

Leachate

A leachate collection system was installed at the site during the summer of 1998. Conveyance piping was installed around the east, west, and south perimeters of the site. Collected leachate is disposed at the Quincy Wastewater Treatment Facility. Leachate samples collected in June and July 1998 by the Illinois Department of Public Health contained elevated levels of vinyl chloride. Although these samples were collected without Illinois EPA oversight and laboratory errors were reported, the results reflected previous leachate sampling done by the Illinois EPA. Information dated to 1986 from the RI, indicated the leachate is characteristically non-hazardous and could be managed by City of Quincy Wastewater Treatment Facility. The results of the analysis presented in Spring 1997, Groundwater/Leachate Monitoring Report indicated similar findings. The design of the leachate management/collection system, based on the data available at that time, required compatibility of the collection system with the leachate and final deposition of the leachate. In October 2000, the leachate holding tank liquids and sludge were cleaned out and sampled. The sample results indicated that the vast majority of the chemicals sampled for were below detection limits. All waste within limits was allowed by the Quincy Wastewater Treatment Facility permit for disposal.

Table 7. 1997-1998 On-site Groundwater Quarterly Samples for Arsenic [4](Comparison values for arsenic – EMEG: child 3 ppb, adult 10 ppb; CREG: 0.02 ppb MCL: 50 ppb)¹

Well	Spring (ppb)	Summer (ppb)	Fall (ppb)	Winter (ppb)	Depth (feet)
Q2D	<1	<1	4	<1	86.8'
Q3D	5	<1	3	<1	46'
Q4D	5	4	3	1	87.9'
Q4S	<1	<1	3	<1	33'
2D	110	100	89	70	18'
3D	<1	2	4	4	26.5'
4D	3	<1	3	4	33'

¹EMEG – environmental dose media evaluation guide; CREG – cancer risk evaluation guide

MCL – maximum contaminant level

ppb = parts per billion

Bold results indicate monitoring wells in areas of leachate runoff.

Table 8. 1997-1998 On-site Groundwater Quarterly Samples for Methacrylonitrile [4](Comparison values for methacrylonitrile – REMG: child 1 ppb, adult 4 ppb)¹

Well	Spring (ppb)	Summer (ppb)	Fall (ppb)	Winter (ppb)	Depth (feet)
Q6S	< 5	< 10	43	< 10	141.94'
2D	< 5	< 10	59	< 10	18'

¹REMG – reference dose media evaluation guide

ppb = parts per billion

Bold results indicate monitoring wells in areas of leachate runoff.

Table 9. 1997-1998 On-site Groundwater Quarterly Samples for Vinyl Chloride [4]

(Comparison values for vinyl chloride – EMEG: child 0.2 ppb, adult 0.7 ppb; MCL: 2 ppb)¹

Well	Spring (ppb)	Summer (ppb)	Fall (ppb)	Winter (ppb)	Depth (feet)
Q3D	4.9 est.	4.3 est.	2.8 est.	4.2 est.	46'
2D	<10	<10	<10	1.2 est.	18'
4D	3.5 est.	<10	2.3 est.	2.6 est.	33'

¹EMEG – environmental dose media evaluation guide; MCL – maximum contaminant level

ppb = parts per billion

est. - result represents estimated value that is below the Practical Quantitative Limit.

Bold results indicate monitoring wells in areas of leachate runoff.

Site Inspections

Site inspections took place in June 2002, September 2002 and December 2002. During the site inspections, the landfill cover was inspected and leachate collection system was observed. The inspection evaluated the landfill cap, the leachate treatment system, the surface water drainage system, and site fencing. Conditions during the inspections were favorable with mild temperatures and no precipitation. The site vegetation was in good condition.

The landfill cap was found to be in good condition. The vegetative cover was adequate and continuing to improve or mature, with no distressed areas, trees or shrubs. No noticeable depressions, excessive cracks, leachate seeps, odors, or other indications of distress were noted. No significant ponding has been observed on the cap. There was some evidence of several small rodent burrows on the south side of the cap. The burrows were generally less than 12 inches deep and no geosynthetics were damaged or waste exposed. Once burrows are identified, they are backfilled with equivalent cap material and, if necessary, repellants are used to discourage further rodent activity.

The fifty-six-acre site is wire fenced on all sides with a locked access gate on the northern boundary. The wire fence is in disrepair in some areas, particularly the western boundary, and allows easy access to anyone wishing to walk on site. The City of Quincy is repairing the fence and posting more signs to warn people that no trespassing is allowed. However, since the site is not continuously staffed, it occasionally gets trespassers. The City of Quincy is also making

periodic checks for trespassers. The City repairs the ruts when they exceed a few inches in depth by backfilling with equivalent cap material and reseeded. Repairs are usually pursued in the spring or fall to enhance revegetation efforts. Due to the ongoing activity, repairs are required on a continuing basis.

No other deficiencies of the cover system or appurtenant structures, including drainage channels and access roads, were noted. With the exception of the rodent holes no intrusive activities were noted on the cover system and no landfill waste or other contaminants were exposed or appeared likely to be exposed. The leachate treatment system was found to be operating and functioning properly. All monitoring well covers are intact and locked and show no signs of damage. Ongoing activities are operating smoothly.

Interviews

The following individuals were contacted by telephone as part of the five-year review:

- Rick Lanham, Illinois EPA Project Manager(Interviewed 1/24/03)
- Donald Kulek, City Engineer, City of Quincy (Interviewed 11/21/03)
- Phil Harvey, Contractor for the City (Interviewed 1/23/03)

Mr. Kulek stated that there are no serious issues related to the site. He noted that groundwater use restrictions remain in place. He also stated that community interest about the site remains low. The area residents seem to be confident that the water they receive through the municipal supply is safe. Mr. Kulek confirmed that no changes in land use were planned for the site, and confirmed that deed restrictions and institutional controls are in place at the site.

VII. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, applicable or relevant and appropriate requirements (ARARs), risk assumptions, and the results of the site inspection indicates that the remedy is functioning as intended by the ROD, as modified by the ESDs. Citizens are on public water supply and a leachate collection system is in place, these two factors have achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct

contact with, or ingestion of, contaminants in soils and sediments.

- **HASP/Contingency Plan:** Both the HASP and the Contingency Plan are in place, sufficient to control risks, and properly implemented.
- **Implementation of Institutional Controls and Other Measures:** The City needs to provide security services for the site to prevent further trespassing and erosion. The fence needs to be maintained. Institutional controls are in place and no current or planned changes in land use at the site suggest that they are not effective.
- **Remedial Action Performance:** The landfill cover system has been effective in isolating waste and contaminants. As previously discussed, some minor erosion/rutting has occurred on the cap but it does not affect the performance or integrity of the cover system. There is no evidence of wetland deterioration due to the site. These factors indicate that the remedial actions continue to be effective and operating and functioning as designed.
- **System Operations/O&M:** System operations procedures are mostly consistent with requirements.
- **Cost of System Operations/O&M:** Costs for the most part have been within an acceptable range.
- **Opportunities for Optimization:** Given the adequate performance at the site, this five-year review does not identify a need for optimization at this time.
- **Early Indicators of Potential Remedy Failure:** No early indicators of potential remedy failure were noted during the review.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the Adams County/Quincy Landfill site that would affect the protectiveness of the remedy.

Changes in Standards and To be Considers

As the remedial work has been completed, most ARARs for sediment, soil and debris contamination cited in the ROD have been met. There have been no changes in these ARARs and no new standards or to be considers (TBCs) affecting the protectiveness of the remedy.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment. These assumptions are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels. No change to these assumptions, or the cleanup levels developed from them is warranted. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. The remedy is progressing as expected and it is expected that all groundwater cleanup levels will be met within 30 years, as specified in the ROD.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other events have affected the protectiveness of the remedy and there is no other information that calls into question the short term and long term protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed and the site inspections, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs for soil, groundwater and sediment contamination cited in the ROD have been met. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information available that calls into question the protectiveness of the remedy.

VIII. ISSUES

The primary operation performed at the site is the removal of leachate from the leachate storage tank and transport it to an off-site treatment facility. Possible problems associated with the operation include: access difficulties, driving accidents, leachate spills, and administrative concerns.

Access difficulties can be addressed by ensuring that the personnel engaged to perform the leachate removal operation coordinate their arrival in advance with the appropriate Group representative, currently anticipated being the City of Quincy. This will allow the City of Quincy to secure the site access road for the tanker truck arrival. It will also allow the City of Quincy an opportunity to coordinate activities at the site if other personnel are scheduled to be on site at the same time. The leachate removal personnel should be provided with a map of the site and have access to a two-way radio in case of access problems or emergencies.

Driving accidents can be avoided through proper access road maintenance and a reduced speed on the part of the driver. Vehicles should not exceed 15 miles per hour on the site access road. Drivers must concentrate at the task-at-hand and be unimpaired by the influence of alcohol or drugs.

Leachate spills can be avoided if proper procedures are followed during the transfer of leachate from the storage tank to the tanker. Connections must be secure and maintained until the flow of leachate is complete and the risk line spillage is no longer present. The tanker should be equipped with spill containment materials in the event a spill occurs. Spill containment materials, If used, must be disposed of properly in accordance with applicable regulations.

Administrative concerns such as coordination of disposal schedules and leachate management operations should be reviewed on a continual basis. The City of Quincy must assume and maintain responsibility for items of this type to ensure administrative problems do not occur.

Table 10 - Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Signs of Trespassing	N	Y
Minor damage to cover	N	Y
Maintenance of monitoring wells	N	Y
Security Measures required	N	Y

IX. Recommendations and Follow-Up Actions

Table 11 - Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-up actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Trespassing	Continue to monitor the site and post signs where trespassing is most likely to occur.	City of Quincy	Illinois EPA	Spring 2003	N	Y
Damage to landfill cover	Keep heavy equipment off of the cover and repair eroded areas as they occur.	City of Quincy	Illinois EPA	Summer 2003	N	Y
Monitoring wells require maintenance	Replace rusted locks and cracked covers.	City of Quincy	Illinois EPA	Summer 2003	N	Y
Security Measures	Repair fence where needed and put up more warning signs where trespassing is likely to occur.	City of Quincy	Illinois EPA	Until cleanup goals are met	N	Y

It is recommended that inspections should be also be performed after extreme meteorological events, such as tornados or extreme rainfall, to ensure the integrity of the access road or cap has not been comprised. The site fencing, gates, and the existing storage building will be inspected at the same frequency as the cover system at least 3-4 times a year. Repairs should be performed when determined through Inspection.

The passive landfill gas management system consists of vent pipes located throughout the area of final cover system installation. These vents will be inspected at the same frequency and duration as the cover system.

X. Protectiveness Statement

The remedy is protective of human health and the environment in the short term. There are no current exposure pathways and the remedy appears to be functioning as designed. The cover and putting citizens on public water supply eliminates the source of contamination and have achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contaminants in soils and sediments.

The cap is effective at containing contaminants through preventing infiltration of rainwater and preventing direct contact with contaminated soils. There is no evidence of wetland degradation. Institutional controls at the landfill remain in place and are effective. Gaps in the fence at the site have been repaired and additional warning signs will be in place in early spring to reduce trespassing.

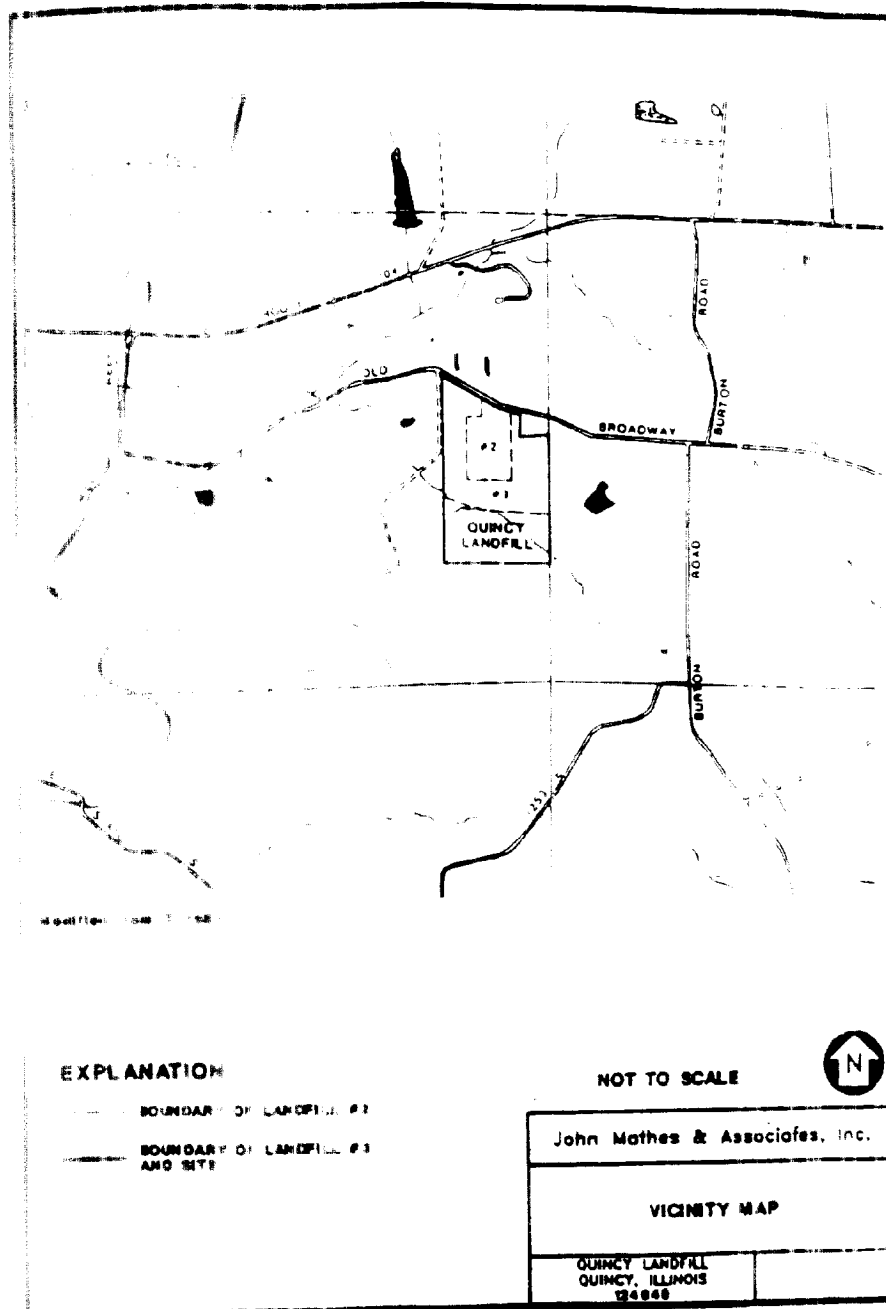
Long-term protectiveness of the of the remedial action will be achieved when cleanup goals are met.

XI. Next Review

The next five-year review for the Adams County/Quincy Landfill site is required by March 2008, five years from the date of this review.

ATTACHMENTS

Attachment 1: Quincy Site Map



ATTACHMENT 2

List of Documents Reviewed

- Emergency Response Action Report
- Final Remedial Investigation and Feasibility Study:
- CERCLA Record of Decision
- Final Remedial Design Report:
- Final Close-Out Report:
- Annual Operation and Maintenance Report,

ATTACHMENT 3

Attachment 3

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Please note that "O&M" is referred to throughout this checklist At sites where Long Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program.

Five-Year Review Site Inspection Checklist (Template)

(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION	
Site name: <u>MUN 2/3 Adams County Landfill</u>	Date of inspection: <u>June 2002 - December 2002</u>
Location and Region: <u>Quincy, Illinois Region 5</u>	EPA ID: <u>ILN 980607055</u>
Agency, office, or company leading the five-year review: <u>U.S. EPA Region V, Chicago, IL</u>	Weather/temperature:
Remedy Includes: (Check all that apply) <input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input checked="" type="checkbox"/> Other <u>Leachate Collection</u> <input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls	
Attachments: <input type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached	
II. INTERVIEWS (Check all that apply)	
1. O&M site manager <u>Donald J. Kulek</u> <u>Asst. City Engineer</u> Name Title Date Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input checked="" type="checkbox"/> by phone Phone no. <u>217-228-4530</u> Problems, suggestions; <input type="checkbox"/> Report attached	
2. O&M staff <u>Rod Davis</u> <u>ENV. TECH</u> Name Title Date Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input checked="" type="checkbox"/> by phone Phone no. <u>217-228-4534</u> Problems, suggestions; <input type="checkbox"/> Report attached	
3. Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of	

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deeds, or other city and county offices, etc.) Fill in all that apply.

Agency IEPA
 Contact RICK LANHAM
 Name Title Date Phone no.
 Problems; suggestions; ☐ Report attached

Agency TERRY ROUNDTREE USEPA
 Contact REMEDIAL PROJECT MANAGER
 Name Title Date Phone no.
 Problems; suggestions; ☐ Report attached

Agency _____
 Contact _____
 Name Title Date Phone no.
 Problems; suggestions; ☐ Report attached

Agency _____
 Contact _____
 Name Title Date Phone no.
 Problems; suggestions; ☐ Report attached

4. Other interviews (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

- I. O&M Documents
- | | | | |
|---|---|--|------------------------------|
| <input checked="" type="checkbox"/> O&M manual <u>DRAFT</u> | <input type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up to date | <input type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> As-built drawings | <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up to date | <input type="checkbox"/> N/A |

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	<input type="checkbox"/> Maintenance logs Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
2.	Site-Specific Health and Safety Plan <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
3.	O&M and OSHA Training Records Remarks _____	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
4.	Permits and Service Agreements <input type="checkbox"/> Air discharge permit <input checked="" type="checkbox"/> Effluent discharge <input checked="" type="checkbox"/> Waste disposal, POTW <input checked="" type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5.	Gas Generation Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
6.	Settlement Monument Records Remarks <u>BENCHMARK ON SITE</u>	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
7.	Groundwater Monitoring Records Remarks _____	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
8.	Leachate Extraction Records Remarks <u>LEACHATE EXTRACTION IS A GRAVITY SYSTEM</u>	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
9.	Discharge Compliance Records <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks <u>MANIFESTS & LAB RESULTS FOR COLLECTED LEACHATE</u>	<input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> N/A
10.	Daily Access/Security Logs Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
IV. O&M COSTS				
1.	O&M Organization			

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<input type="checkbox"/> State in-house <input checked="" type="checkbox"/> PRP in-house <input type="checkbox"/> Federal Facility in-house <input type="checkbox"/> Other _____	<input type="checkbox"/> Contractor for State <input type="checkbox"/> Contractor for PRP <input type="checkbox"/> Contractor for Federal Facility
---	--

2. **O&M Cost Records**
☒ Readily available ☒ Up to date
☐ Funding mechanism/agreement in place
 Original O&M cost estimate _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From <u>8-1999</u>	To <u>8-2000</u>	<u>\$154,194.54</u>	
Date	Date	Total cost	<input type="checkbox"/> Breakdown attached
			<u>Available</u>
From <u>8-2000</u>	To <u>8-2001</u>	<u>\$201,153.36</u>	
Date	Date	Total cost	<input type="checkbox"/> Breakdown attached
			<u>Available</u>
From <u>8-2001</u>	To <u>8-2002</u>	<u>123,923.86</u>	
Date	Date	Total cost	<input type="checkbox"/> Breakdown attached
			<u>Available</u>
From <u>8-2002</u>	To <u>PRESENT</u>		
Date	Date	Total cost	<input type="checkbox"/> Breakdown attached
			<u>Available</u>
From _____	To _____		
Date	Date	Total cost	<input type="checkbox"/> Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
 Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A
 Remarks _____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
 Remarks STENS IN PLACE

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

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VII. LANDFILL COVERS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
A. Landfill Surface			
1.	Settlement (Low spots) Areal extent _____ Depth _____ Remarks <u>SETTLEMENT OF TOPSOIL STARTING TO SHOW BEHIND</u> <u>BERMS. WILL SURVEY TO DETERMINE EXTENT, FILL & RESEED</u>	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident	
2.	Cracks Lengths _____ Widths _____ Depths _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Cracking not evident	
3.	Erosion Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Erosion not evident	
4.	Holes Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Holes not evident	
5.	Vegetative Cover <input checked="" type="checkbox"/> Grass <input checked="" type="checkbox"/> Cover properly established <input type="checkbox"/> No signs of stress <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks _____		
6.	Alternative Cover (armored rock, concrete, etc.) Remarks _____	<input checked="" type="checkbox"/> N/A	
7.	Bulges Areal extent _____ Height _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Bulges not evident	
8.	Wet Areas/Water Damage <input type="checkbox"/> Wet areas <input checked="" type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map	Areal extent _____ Areal extent _____ Areal extent _____ Areal extent _____

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Remarks <u>PONDING IN SETTLE AREAS BEHIND BERMS</u>			
9.	Slope Instability Areal extent _____ Remarks _____	<input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of slope instability
B. Benches <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	Flows Bypass Bench Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
2.	Bench Breached Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
3.	Bench Overtopped Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
C. Letdown Channels <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	Settlement Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of settlement
2.	Material Degradation Material type _____ Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of degradation
3.	Erosion Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of erosion
4.	Undercutting Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of undercutting
5.	Obstructions Type _____		<input checked="" type="checkbox"/> No obstructions

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<input type="checkbox"/> Location shown on site map Size _____ Remarks _____	Areal extent _____
6. Excessive Vegetative Growth Type <u>GRASS & SAPPINGS</u> <input type="checkbox"/> No evidence of excessive growth <input checked="" type="checkbox"/> Vegetation in channels does not obstruct flow <input type="checkbox"/> Location shown on site map Areal extent _____ Remarks <u>+ 1 INCH DIA. COTTONWOOD SAPPINGS ARE SHOWING UP IN RYD RAP CHANNELS. WILL BE CUT THIS SPRING</u>	
D. Cover Penetrations <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1. Gas Vents <input type="checkbox"/> Active <input checked="" type="checkbox"/> Passive <input type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____	
2. Gas Monitoring Probes <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____	
3. Monitoring Wells (within surface area of landfill) <input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks <u>WELL Q1D TO BE REPAIRED BEFORE NEXT SAMPLING EVENT WELL BENT DURING MOWING</u>	
4. Leachate Extraction Wells <input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> Functioning <input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks <u>LEACHATE EXTRACTION PL. IS OK UST THAT LEACHATE COLLECTION SYSTEM DRAINS TO.</u>	
5. Settlement Monuments <input type="checkbox"/> Located <input type="checkbox"/> Routinely surveyed <input checked="" type="checkbox"/> N/A Remarks <u>BENCHMARK ON SITE</u>	
E. Gas Collection and Treatment <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1. Gas Treatment Facilities <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____	

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2.	Gas Collection Wells, Manifolds and Piping		
	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	
	Remarks _____		
3.	Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)		
	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks <u>GAS MONITORING PLS UNDER NEGOTIATION W/ EPA PENDING INVESTIGATION. EASEMENT FOR OFF-SITE TESTING JUST NEGOTIATED.</u>		
F. Cover Drainage Layer			
	<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A	
1.	Outlet Pipes Inspected	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
2.	Outlet Rock Inspected	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
G. Detention/Sedimentation Ponds			
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
1.	Siltation Areal extent _____ Depth _____	<input type="checkbox"/> N/A	
	<input type="checkbox"/> Siltation not evident		
	Remarks _____		
2.	Erosion Areal extent _____ Depth _____		
	<input type="checkbox"/> Erosion not evident		
	Remarks _____		
3.	Outlet Works	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
4.	Dam	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
H. Retaining Walls			
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
1.	Deformations	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks _____		
2.	Degradation	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks _____		

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I. Perimeter Ditches/Off-Site Discharge		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	Siltation <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Siltation not evident Areal extent _____ Depth _____ Remarks _____		
2.	Vegetative Growth <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Vegetation does not impede flow Areal extent _____ Type _____ Remarks _____		
3.	Erosion <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Erosion not evident Areal extent _____ Depth _____ Remarks _____		
4.	Discharge Structure <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____		
VIII. VERTICAL BARRIER WALLS		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Settlement <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident Areal extent _____ Depth _____ Remarks _____		
2.	Performance Monitoring Type of monitoring _____ <input type="checkbox"/> Performance not monitored Frequency _____ <input type="checkbox"/> Evidence of breaching Head differential _____ Remarks _____		
IX. GROUNDWATER/SURFACE WATER REMEDIES		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines		<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	Pumps, Wellhead Plumbing, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____		
2.	Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____		

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3.	Spare Parts and Equipment <input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____		
B. Surface Water Collection Structures, Pumps, and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	Collection Structures, Pumps, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____		
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____		
3.	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____		
C. Treatment System <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	Treatment Train (Check components that apply) <input type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters _____ <input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks _____		
2.	Electrical Enclosures and Panels (properly rated and functional) <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____		
3.	Tanks, Vaults, Storage Vessels <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____		

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4.	Discharge Structure and Appurtenances			
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	
	Remarks _____			
5.	Treatment Building(s)			
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition (esp. roof and doorways)	<input type="checkbox"/> Needs repair	
	<input type="checkbox"/> Chemicals and equipment properly stored			
	Remarks _____			
6.	Monitoring Wells (pump and treatment remedy)			
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A	
	Remarks _____			
D. Monitoring Data				
•	Monitoring Data			
	<input type="checkbox"/> Is routinely submitted on time		<input checked="" type="checkbox"/> Is of acceptable quality	
•	Monitoring data suggests:			
	<input type="checkbox"/> Groundwater plume is effectively contained		<input type="checkbox"/> Contaminant concentrations are declining	
D. Monitored Natural Attenuation				
1.	Monitoring Wells (natural attenuation remedy)			
	<input type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled	<input checked="" type="checkbox"/> Good condition
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A	
	Remarks _____			
X. OTHER REMEDIES				
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.				
XI. OVERALL OBSERVATIONS				
A.	Implementation of the Remedy			
	Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).			

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B. Adequacy of O&M
<p>Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.</p> <p><i>The remedy is responding effectively in the short term and should be just as effective in the long term if O&M activity continues.</i></p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
C. Early Indicators of Potential Remedy Problems
<p>Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.</p> <p><i>Minor cover repairs, & Posting of more "No Trespassing Signs"</i></p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
D. Opportunities for Optimization
<p>Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.</p> <p><i>Site is in its early stages of O&M to early for optimization opportunities</i></p> <hr/> <hr/> <hr/> <hr/>

ATTACHMENT 4

QUINCY, ILLINOIS

[illegible]

[illegible]

Parameters	Units	Class I Remediation Objectives	4D	4D	4D	4D	4D	4D	Q4S	Q4S	Q4S	Q4S	Q4S	Q4S	Q4S	Q4S	Q4S
			3/25/97	3/30/97	9/13/97	1/13/98	11/23/00	11/17/00	3/25/97	7/1/97	9/23/97	1/14/98	11/12/00	3/26/97	7/1/97	9/23/97	1/14/98
							App. I	Dep. App. I									
1,4-Dichlorobenzene	µg/l	75															
4-chloro-3-methylphenol	µg/l																
Acetophenone	µg/l																
Benzoic Acid	µg/l	28000		9.1 JB													
Bis(2-ethylhexyl)phthalate	µg/l	6		8.1		16 B				27	2.6 JB	6.6 JB			61	40	93
Diethyl Phthalate	µg/l	5600															
Dimethyl Phthalate	µg/l																
Di-N-butyl Phthalate	µg/l				210												
Hexachlorophene	µg/l																
Phenol	µg/l	100															
OCDD	ppt																
Cyanide	mg/l	0.2		0.012						0.029							
Aluminum, Dissolved	mg/l																
Aluminum, Total	mg/l																
Antimony, Dissolved	mg/l	0.006				0.024											
Antimony, Total	mg/l	0.006				0.021											
Arsenic, Dissolved	mg/l	0.05	0.003		0.003	0.004							0.002	0.001			
Arsenic, Total	mg/l	0.05	0.005		0.005	0.003				0.005	0.004	0.002			0.003		
Barium, Dissolved	mg/l	2	0.11	0.11	0.081	0.14											
Barium, Total	mg/l	2	0.12	0.15	0.093	0.14											
Cadmium, Dissolved	mg/l	0.005				0.011											
Cadmium, Total	mg/l	0.005				0.003											
Calcium, Dissolved	mg/l		230	200	180	240	244	224									
Calcium, Total	mg/l						236	246									
Chromium, Dissolved	mg/l	0				0.002											
Chromium, Total	mg/l	0		0.01		0.011											
Cobalt, Dissolved	mg/l	1				0.011											
Cobalt, Total	mg/l	1				0.01											
Copper, Dissolved	mg/l	0.65				0.008											
Copper, Total	mg/l	0.65		0.022		0.011											
Iron, Dissolved (feric)	mg/L	5	18	19	23												
Iron, Dissolved	mg/L	5					23	22		0.067					0.23	0.099	0.091
Iron, Total	mg/L	5					23	24	0.76	0.18	0.47	0.12			1.1	1	0.43
Lead, Dissolved	mg/l	0.0075	0.003		0.054	0.003											
Lead, Total	mg/l	0.0075	0.004	0.014	0.054	0.01											
Magnesium, Dissolved	mg/l		71	63	60	77	29.5	22.9									
Magnesium, Total	mg/l						77	80.1									
Manganese, Dissolved	mg/L	0.15	3.4	1.8	3.3	4.5	5.2	4.7	0.01						0.019	0.021	0.01
Manganese, Total	mg/l	0.15					5	5.2	0.029	0.064	0.036				0.053	0.028	0.028
Mercury, Total	mg/l	0.002				0.0003										0.037	
Nickel, Dissolved	mg/l	0.1				0.021											
Nickel, Total	mg/l	0.1				0.057											
Potassium, Dissolved	mg/l		8	0.98	0.69	1.3											
Potassium, Total	mg/l																
Selenium, Dissolved	mg/l	0.05														0.002	
Selenium, Total	mg/l	0.05								0.001						0.003	0.001
Silver, Dissolved	mg/l	0.05															

TABLE

SUMMARY OF GROUNDWATER CHEMICAL DATA-SHALLOW WELLS
ADAMS COUNTY QUINCY LANDFILLS 2 AND 3
QUINCY, ILLINOIS

Parameters	Units	Class 1 Remediation Objectives	4D 3/25/97	4D 6/30/97	4D 9/23/97	4D 1/13/98	4D 11/11/00 App. I	4D 11/11/00 Dup. App. I	Q4S 3/25/97	Q4S 7/1/97	Q4S 9/23/97	Q4S 1/14/98	Q4S 11/12/00	Q5S 3/26/97	Q5S 7/1/97	Q5S 9/23/97	Q5S 1/14/98	Q5S 11/11/00
Sodium, Dissolved	mg/l		79	55	52	67	70.2	64.3										
Sodium, Total	mg/l						68	70.8										
Thallium, Dissolved	mg/l	0.002																
Thallium, Total	mg/l	0.002																
Tin, Dissolved	mg/l		0.056			0.069												
Tin, Total	mg/l		0.075	0.057		0.06												
Zinc, Dissolved	mg/l	5	0.033	0.025	0.055	0.024	0.026	0.020	0.015	0.086	0.009			0.029	0.028	0.099		
Zinc, Total	mg/l	5	0.042	0.098	0.067	0.055	0.020	0.021	0.023	2.4	0.16			0.028	0.15	0.099	0.066	
4,4'-DDD (p,p'-DDD)	µg/l	0.11																
Aldrin	µg/l	0.04		0.01														
Beta-BHC	µg/l																	
Delta-BHC	µg/l			0.01														
Heptachlor	µg/l	6.4		0.01														
1,1-Dichloroethane	µg/l	700	30	29	26	26	30	30					2.5					
1,4-Dioxane	µg/l																	
2-Butanone	µg/l																2.7	J
Acetone	µg/l	700		1.1					1.5	JB				2.7	JB		2.2	JB
Acetonitrile	µg/l																	
Benzene	µg/l	5	0.5															
Chlorobenzene	µg/l	100																
Chloroethane	µg/l		7.3		8.9	8.4	6.6	6.9										
Chloromethane	µg/l				2.1													
Cis-1,2-Dichloroethene	µg/l	70	15	15	14	12	16	16					1.4					
Dichlorodifluoromethane	µg/l					1.6												
Ethylbenzene	µg/l	700																
Isobutanol	µg/l																	
Methacrylonitrile	µg/l																	
Methylene Chloride	µg/l	5							0.7	JB								
Toluene	µg/l	1000							0.1	JB								
Trans-1,2-Dichloroethene	µg/l	100	0.7										1.3					
Trichloroethene	µg/l	5											4.7					
Vinyl Chloride	µg/l	2	3.5		2.3	2.6	<2.0	2.0										
Xylenes, Total	µg/l	10000											1.0					

Parameters	Units	Class 1 Remediation Objectives	Q3A	Q3D	Q3D	Q3D	Q3D	Q4D	Q4D	Q4D	Q4D	Q4D	Q4D
			3/25/97	6/30/97	9/23/97	1/13/98	12/11/00	3/25/97	6/30/97	9/23/97	1/16/98	11/23/00	12/13/00 Unp.
							App. 1						
1,4-Dichlorobenzene	µg/l	75											
4-chloro-3-methylphenol	µg/l												
Acetophenone	µg/l												
Benzoic Acid	µg/l	28000											
Bis(2-ethylhexyl)phthalate	µg/l	6	15	24	19	8.8	18		6.8				
Diethyl Phthalate	µg/l	5600											
Dimethyl Phthalate	µg/l												
Di-N-butyl Phthalate	µg/l				200								
Hexachlorophene	µg/l												
Phenol	µg/l	100											
OC(D)	µl/l												
Cyanide	mg/l	0.2							0.0018				
Aluminum, Dissolved	mg/l												
Aluminum, Total	mg/l												
Antimony, Dissolved	mg/l	0.006				0.009							
Antimony, Total	mg/l	0.006											
Arsenic, Dissolved	mg/l	0.05	0.003		0.003			0.005	0.004	0.003			
Arsenic, Total	mg/l	0.05	0.006		0.007	0.001		0.005	0.005	0.006	0.001		
Barium, Dissolved	mg/l	2	0.11	0.11	0.093	0.11							
Barium, Total	mg/l	2	0.12	0.12	0.11	0.12							
Cadmium, Dissolved	mg/l	0.005				0.001							
Cadmium, Total	mg/l	0.005											
Calcium, Dissolved	mg/l		200	190	190	170	231						
Calcium, Total	mg/l						232						
Chromium, Dissolved	mg/l	0.1				0.001							
Chromium, Total	mg/l	0.1				0.002							
Cobalt, Dissolved	mg/l	1	0.022	0.019	0.012	0.02							
Cobalt, Total	mg/l	1	0.021	0.019	0.015	0.023							
Copper, Dissolved	mg/l	0.65				0.008							
Copper, Total	mg/l	0.65											
Iron, Dissolved (Ferric)	mg/l	5	0.98	12	1.1								
Iron, Dissolved	mg/l	5					1.7	0.7	0.7	0.57	0.41	1.0	1.0
Iron, Total	mg/l	5					1.7	0.79	1.4	0.65	0.88	1.0	1.1
Lead, Dissolved	mg/l	0.007			0.034	0.001							
Lead, Total	mg/l	0.007		0.003	0.09	0.002							
Magnesium, Dissolved	mg/l		48	45	44	41	52.2						
Magnesium, Total	mg/l						52.3						
Manganese, Dissolved	mg/l	0.15	4.3	3.8	3.5	3.6	4.8	1.8	1.4	0.67	1.5	1.4	1.4
Manganese, Total	mg/l	0.15					4.7	1.9	1.4	0.71	1.4	1.4	1.4
Mercury, Total	mg/l	0.002											
Nickel, Dissolved	mg/l	0.1	0.013	0.047		0.05	0.061						
Nickel, Total	mg/l	0.1	0.016	0.048	0.047	0.052	0.061						
Potassium, Dissolved	mg/l		1.1	1.3	1.8	1.8							
Potassium, Total	mg/l												
Selenium, Dissolved	mg/l	0.05											
Selenium, Total	mg/l	0.05											
Silver, Dissolved	mg/l	0.05											

TABLE

SUMMARY OF GROUNDWATER CHEMICAL DATA-SHALLOW WELLS
ADAMS COUNTY QUINCY LANDFILLS 2 AND 3
QUINCY, ILLINOIS

Parameters	Units	Class 1 Remediation Objectives	Q3D 3/25/97	Q3D 6/30/97	Q3D 9/23/97	Q3D 11/13/98	Q3D 11/13/00 App. 1	Q4D 3/25/97	Q4D 6/30/97	Q4D 9/23/97	Q4D 11/13/98	Q4D 11/13/00	Q4D 11/13/00 Dup.
Sodium, Dissolved	mg/L		57	46	42	38	49.8						
Sodium, Total	mg/L						50						
Thallium, Dissolved	mg/L	0.002			0.01								
Thallium, Total	mg/L	0.002			0.017								
Tin, Dissolved	mg/L												
Tin, Total	mg/L					0.055							
Zinc, Dissolved	mg/L	5	0.032	0.027	0.029	0.028	0.035	0.014	0.078	0.032	0.035		
Zinc, Total	mg/L	5	0.033	0.051	0.14	0.021	0.035	0.045	0.13	0.056	0.028		
4,4'-DDD (p,p'-DDD)	µg/L	0.43		0.05									
Aldrin	µg/L	0.04											
Beta-BHC	µg/L												
Delta-BHC	µg/L			0.01									
Heptachlor	µg/L	0.4											
1,1-Dichloroethane	µg/L	700	41	47	35	40	37	19	17	47	1	1.8	1.7
1,4-Dioxane	µg/L												
2-Butanone	µg/L												
Acetone	µg/L	700	1		4								
Acetonitrile	µg/L												
Benzene	µg/L	5											
Chlorobenzene	µg/L	100											
Chloroethane	µg/L		7.9		8.7	12	6.9	3.4		1.5	3.3	2.6	2.3
Chloromethane	µg/L				1.5								
Cis-1,2-Dichloroethene	µg/L	70	15	18	11	13	15	4.3			1.5	1.5	1.4
Dichlorodifluoromethane	µg/L												
Ethylbenzene	µg/L	700											
Isobutanol	µg/L							85					
Methacrylonitrile	µg/L												
Methylene Chloride	µg/L	5											
Toluene	µg/L	1000	0.2										
Trans-1,2-Dichloroethene	µg/L	100											
Trichloroethene	µg/L	5	1.9		1	1.3	1.5						
Vinyl Chloride	µg/L	5	4.9	4.3	2.8	4.2	3.0	1.6					
Xylenes, Total	µg/L	10000											

Note:

- J - analyte was positively identified below the practical quantitation limit; concentration is estimated
 S - outlying surrogate results; estimated concentration
 B - analyte detected in associated method blank

3.0 - Concentration exceeds Tier 1 Remediation Objective for Class 1 groundwater
 App. 1 - Sample analyzed for Illinois Appendix 1 list of parameters